

1997-1998: PNGV “Wake Up” Call

- **At October 1997 Tokyo Auto show, Toyota announces the Prius hybrid electric vehicle**
- **First (modern) hybrid electric vehicle (HEV) for sale**
- **Believed, in part, to be instigated by formation of PNGV**

Hybrid Electric Vehicles



Honda Insight

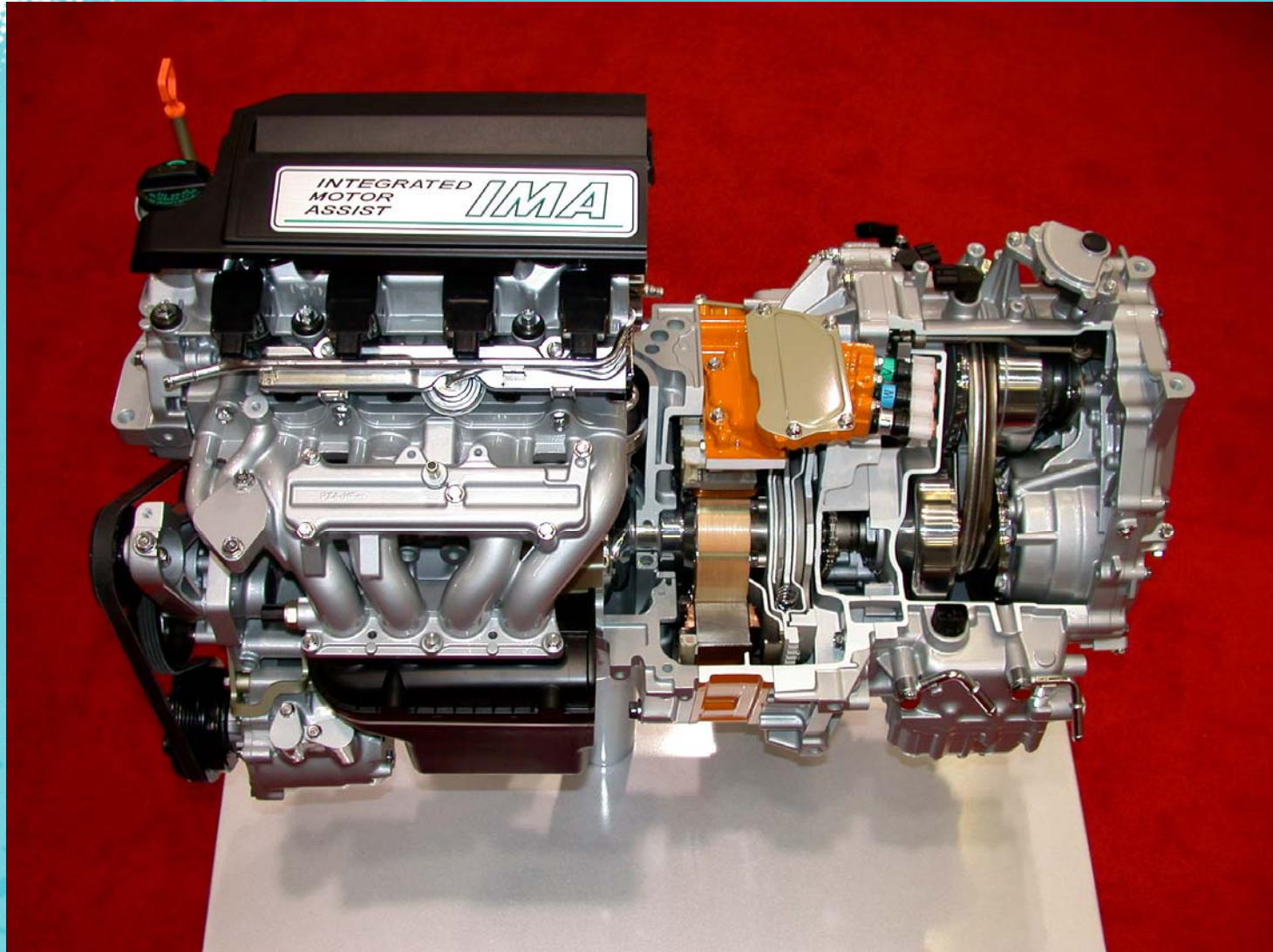
- Gasoline fueled
- NiMH batteries
- 2-seat, 2-door
- Meets ULEV standard

Toyota Prius

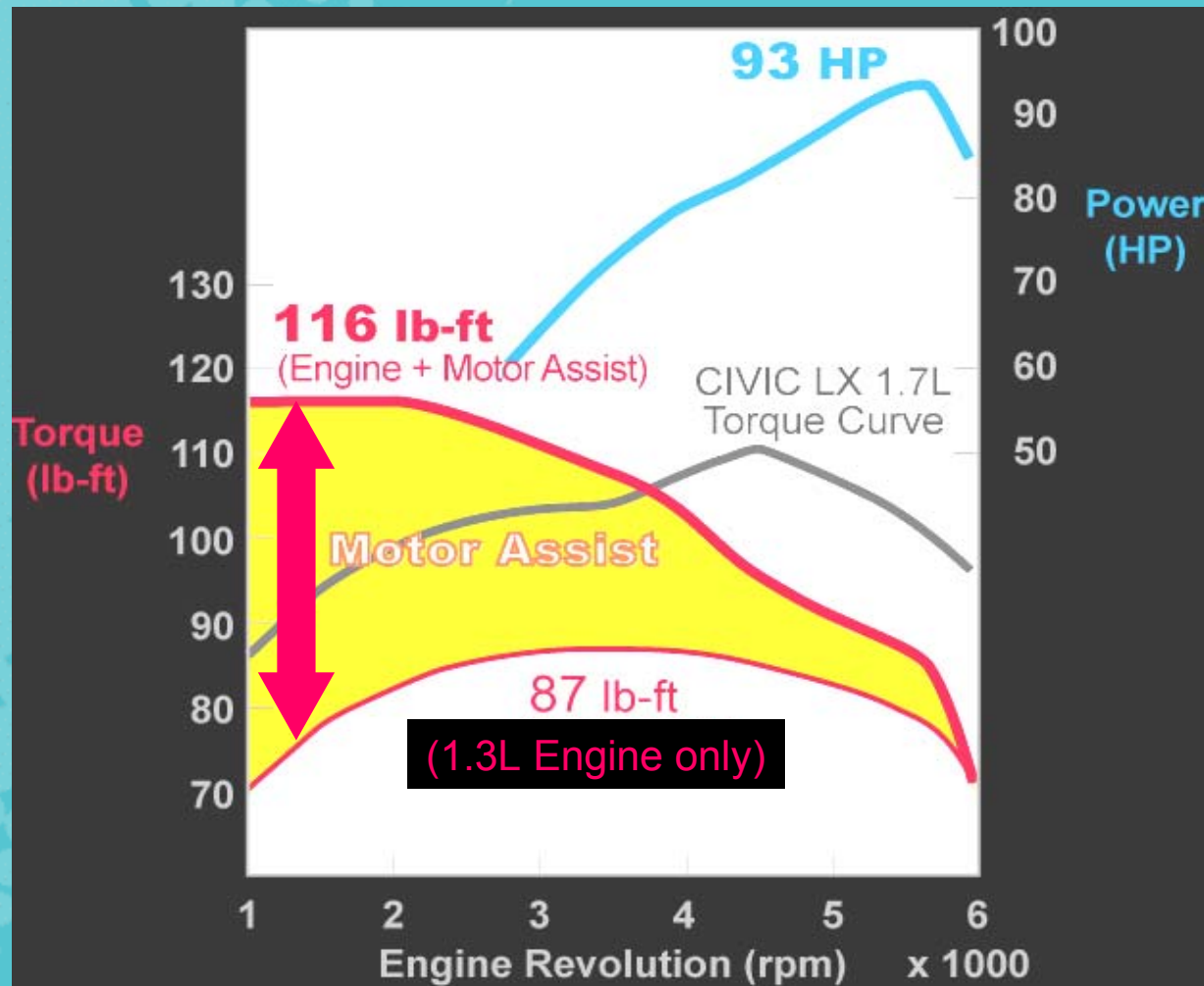
- Gasoline fueled
- NiMH batteries
- 5-seat, 4-door
- Meets SULEV standard



Honda Hybrids



Hybrid Electric Benefits

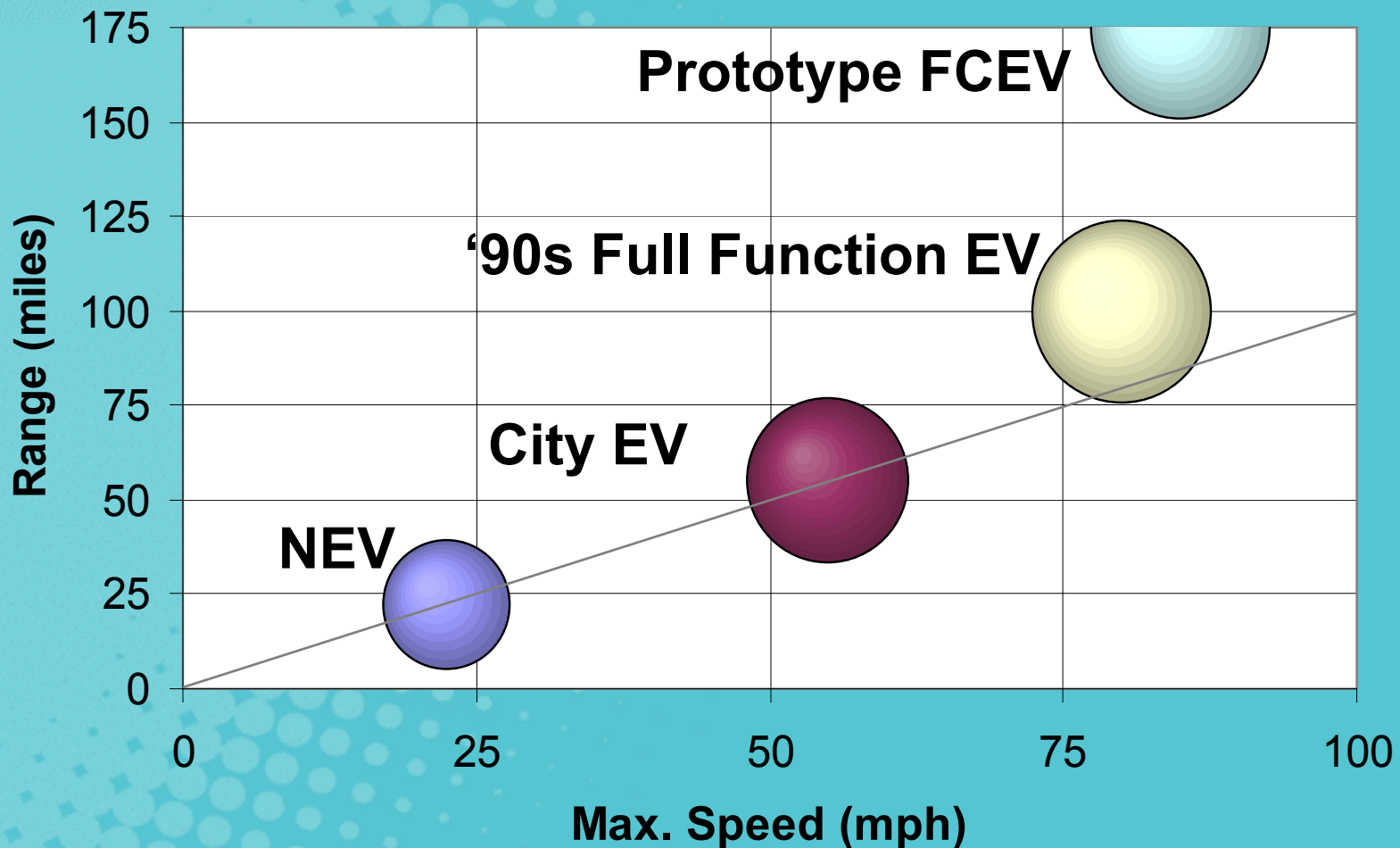


1998: Neighborhood EVs (NEVs)



ZEV

Range-Speed Graph



1998: DOT Low Speed Vehicle (LSV) Category

- USDOT established new Low Speed Vehicle (LSV) category in 1998
- Created due to increasing conflicts between state and federal law
- LSV's are in-between passenger car and golf carts
- Rulemaking initiated in response to Bombardier, Inc. in 1996
- LSVs did not exist early on in ZEV regulation
- **Would meet definition of “motor vehicle”**

1998: Neighborhood EVs (NEVs)

- **US DOT Low Speed Vehicle definition:**
 - 4-wheel motor vehicle
 - Minimum 20 mph (32 kph)
 - Maximum 25 mph (40 kph)
 - DOT provides no powerplant definition, so
 - **NEVs = LSVs that are zero emission**
 - **LSVs= Any vehicle meeting
US 49 CFR Part 571**

1998+: Neighborhood EV (NEV)

- **NEVs do very little to “push” EV technology development**
 - (-) Brushed DC Motors**
 - (-) Flooded (not sealed) lead acid batteries**
 - (+) Regenerative braking (some)**
- **Air Quality Benefits**
 - Vehicle miles traveled**
 - Cold starts avoided**

1999: GM EV1 Status

- **GM releases the GEN II EV1**
- **Motor & Controller now smaller and less costly to manufacture**
- **Available with 2 choices in batteries:**
 - **“Standard”, “High Capacity” Panasonic lead-acid (replacing the Delco batteries used formerly), or**
 - **“Optional” Ovonic Nickel metal hydride**